



# Cognitive IoT Recipe Maven

## Digital Expertise in the Kitchen

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# Motivation

- Food wastage is currently 40% in North America [1]
- Obesity rate is increasing globally [2]
- Limited context integration in existing applications
  - Nutrient information and dietary goals
  - Effective use of expiry dates
  - Knowledge of users' taste, preferences, allergies and diseases
- Limited knowledge and time to cook healthy
- Sparse and duplicate data across multiple devices and applications

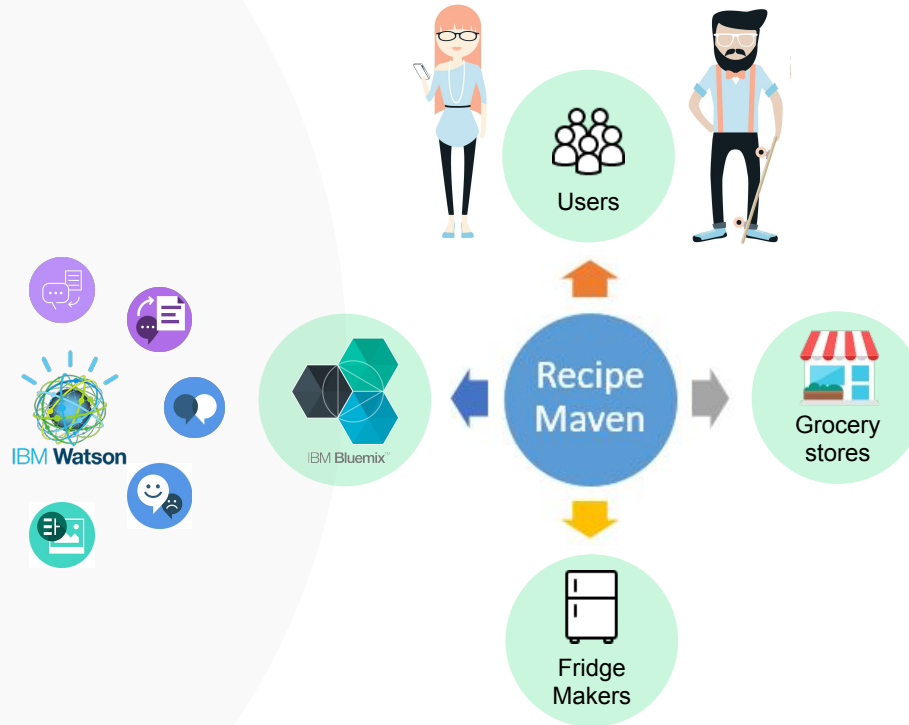
[1] <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3228640/>

[2] <https://www.hsph.harvard.edu/obesity-prevention-source/obesity-trends/obesity-rates-worldwide/>

# Outline

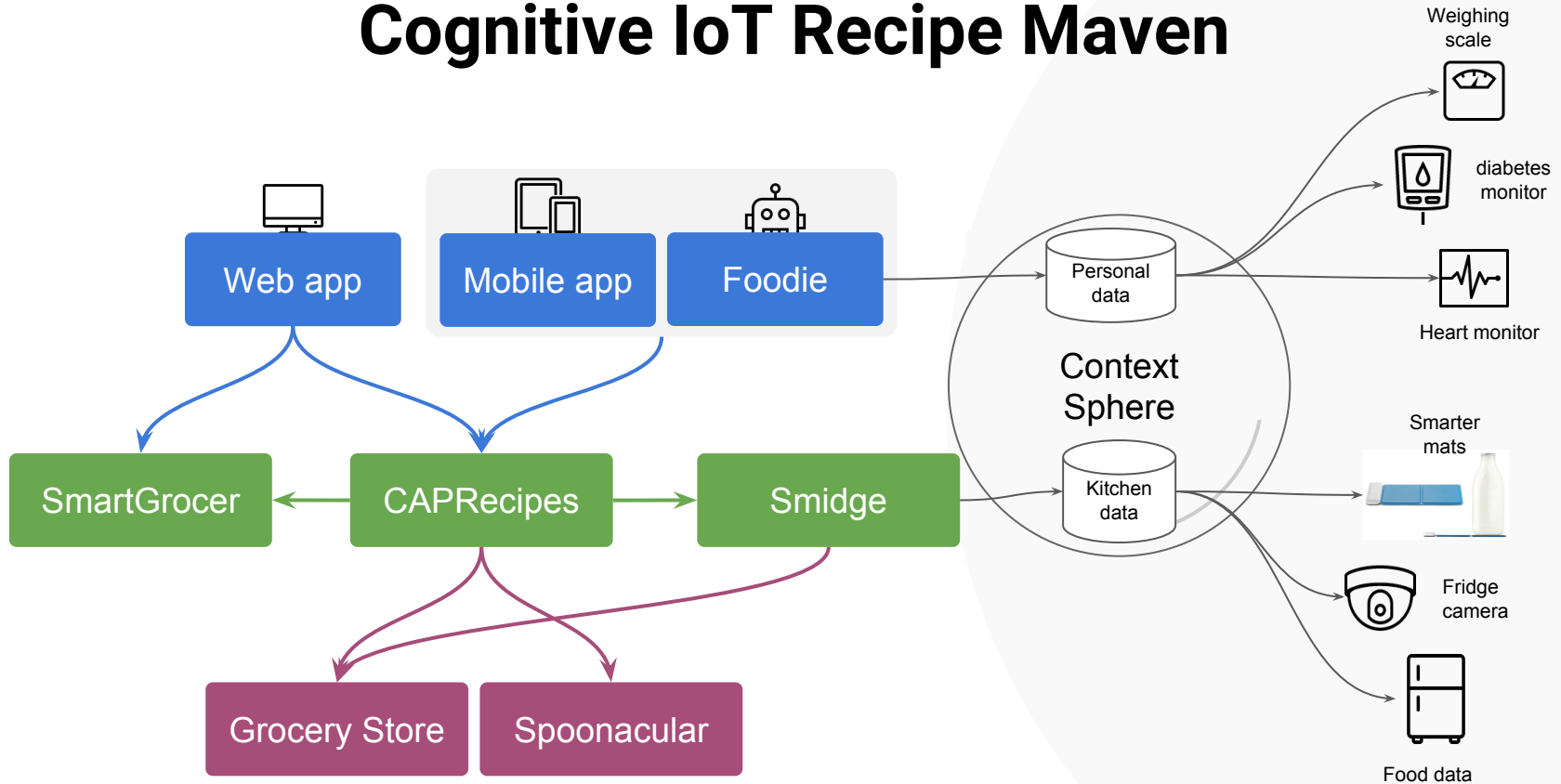
1. Overview of the IoT Recipe Maven
2. Key stakeholders
3. Maven components
  - a. CAPRecipes: context-aware personalized recipes recommender
  - b. Foodie Fooderson: a conversational agent for the smart kitchen
  - c. Smidge: Smart Refrigerator and Grocery
  - d. SmartGrocer: a profit-aware store path optimizer
4. Challenges
5. Conclusion

# Key Stakeholders

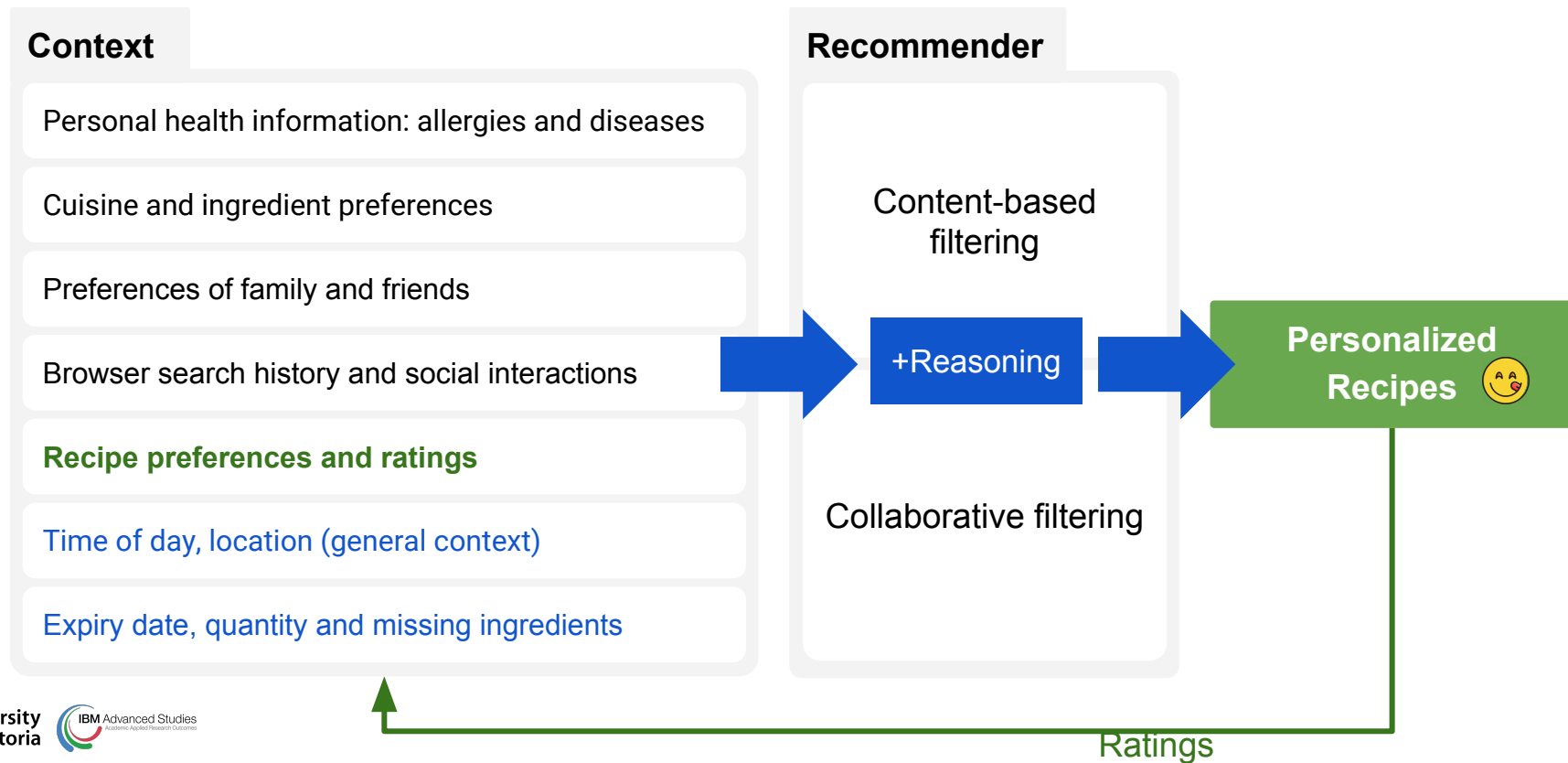


- ❖ Smidge
- ❖ SmartGrocer
- ❖ CAPRecipes
- ❖ Foodie

# Cognitive IoT Recipe Maven

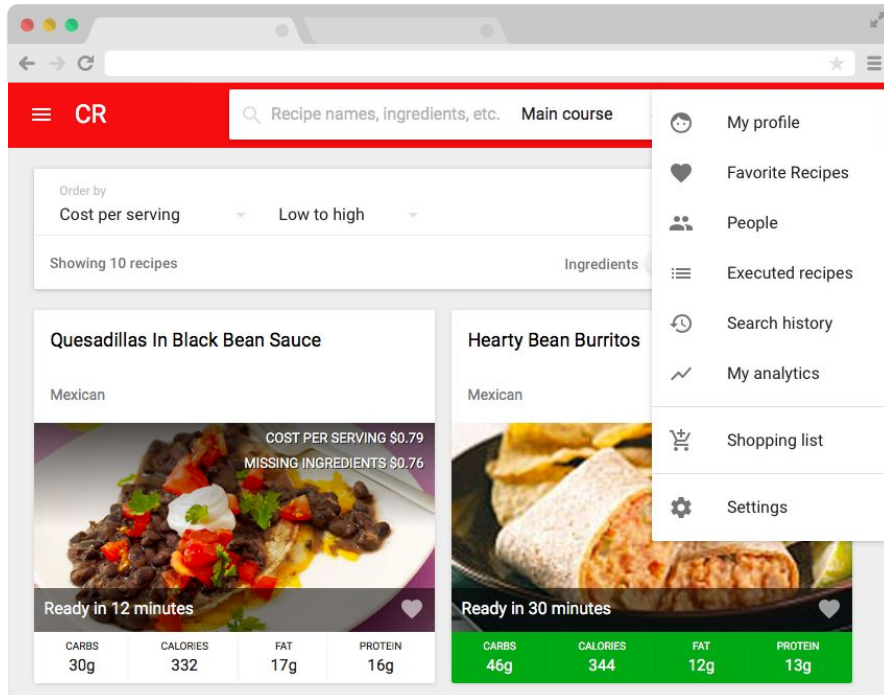


# CAPRecipes: Context-Aware Recipe Recommendation



# CAPRecipes: Hybrid interface

Web UI



Mobile Application

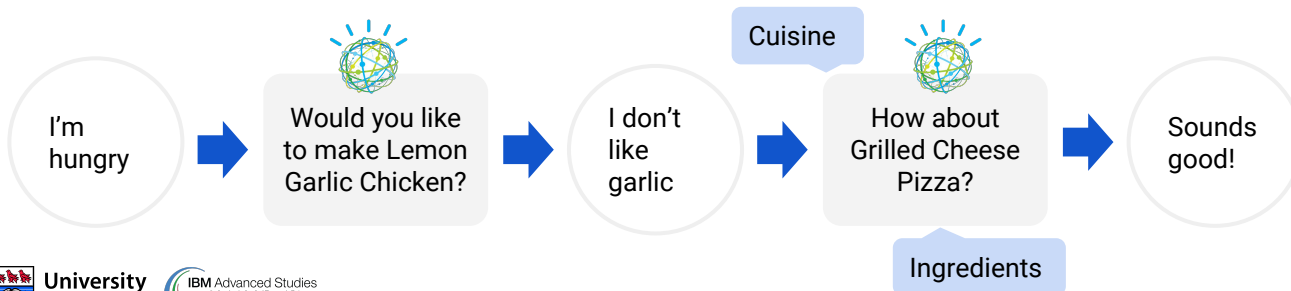


# Foodie: A Cognitive Kitchen Assistant



A cognitive conversational assistant connected to our recipe recommendation engine that:

- Assists people in finding a suitable recipe
- Describes step-by-step cooking instructions
- Provides nutrition information
- Helps people in creating and tracking dietary goals

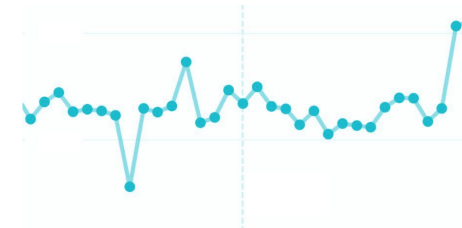


[...] how much fat is in that recipe?

Foodie, I'd like to reduce my intake of sugar



Sugar intake



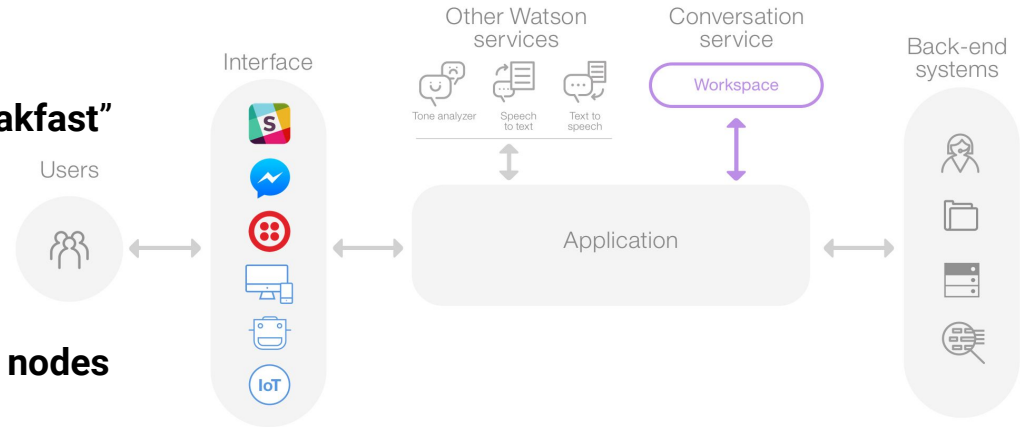
Body Weight



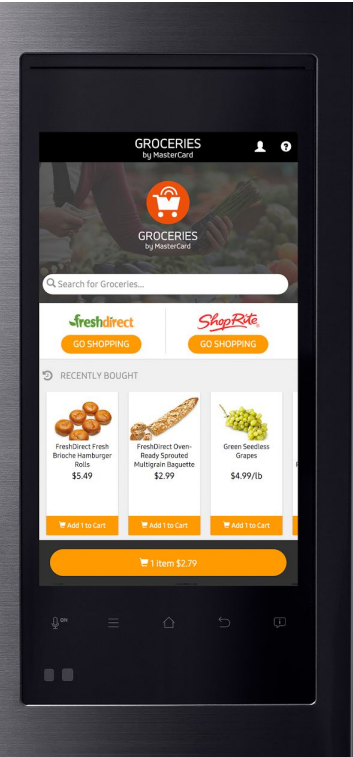
# Foodie: A Cognitive Kitchen Assistant (2)

## Under the Hood

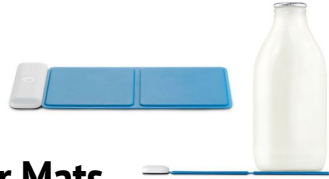
- #Intents
  - Determine the purpose of arbitrary user input
  - Example: “I’m feeling hungry” is classified under the intent **#start\_cooking**
- @Entities
  - Keyword identification
  - Example: “I want to eat a french breakfast”
    - @cuisine = french
    - @mealType = breakfast
- Dialog
  - Possible flows of a conversation via **nodes**
  - **Nodes** are triggered by conditions
- Context
  - Mechanism for passing information between the dialog and the application



# Smidge: Smart Refrigerator and Grocery



FridgeCam



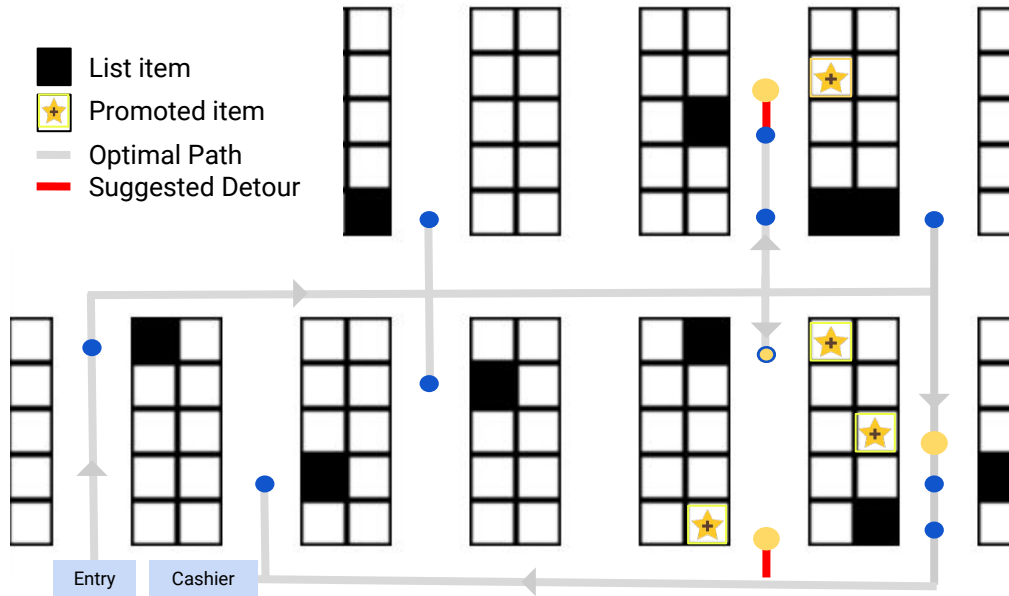
Smarter Mats

- FridgeCam: Analyze contents of the fridge
- Smarter Mats: Track weights for contents in the fridge
- 



- Update ingredient inventory through grocery receipts
- Personalize recommendations for coupons to increase savings

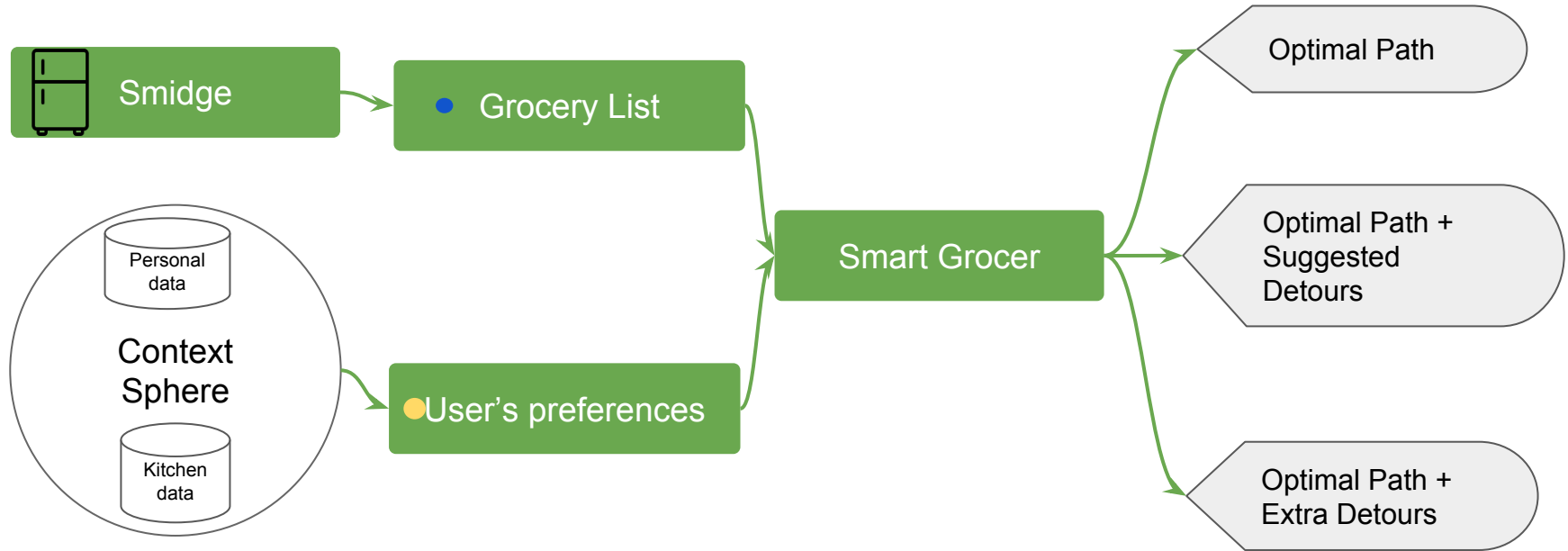
# Smart Grocer: Profit-Aware Store Path Optimization



Promote products by incentivizing customers:

- Guide users through the store to purchase a list of items
- Indicate additional items in or near the customer's path that the store wants to promote or offer discounts on.

# Smart Grocer: Profit-Aware Store Path Optimization



# Challenges

Discovering agents in a shared environment to accomplish tasks collaboratively.

Effective context management

Foodie

Building a richer conversational agent is difficult. Platforms are not sophisticated enough yet.

Accurate voice recognition services for people with accents and environments with noise

Smidge

Accurately identifying products inside the fridge

# Key Takeaways

Cognitive IOT Recipe Maven integrates food-related applications and uses context to collaboratively enhance the user experience.

It includes CAPRecipes, a context-aware personalized recipes recommender, Foodie: a conversational agent for the smart kitchen, Smidge: An IoT Enabled Fridge and SmartGrocer: a profit-aware store path optimizer

There is great potential for building systems which cross context barriers and enhance user experiences.

# Thanks

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